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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/708,301

02/23/2004

Akira Kuibira

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29453

7590

08/18/2008

Judge Patent Associates

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JAPAN

EXAMINER

PAIK, SANG YEOP

ART UNIT

PAPER NUMBER

3742

MAIL DATE

DELIVERY MODE

08/18/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/708,301	<b>Applicant(s)</b> KUIBIRA ET AL.	
	<b>Examiner</b> Sang Y. Paik	<b>Art Unit</b> 3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3,8-10 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,8-10 and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 8-10 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuibira et al (US 2002/0007911) in view of Hiramatsu et al (US 6,507,006), Fure et al (US 2003/0015517), Kadomura et al (US 5,968,273) or Shamouilian et al (US 6,462,928), and Kanno et al (US 2003/0168439) or Takuma et al (JP 09-249465).

Kuibira shows the structure claimed including a ceramic susceptor made of aluminum oxide or aluminum nitride having the thermal conductivity of 100 w/mk or more with a resistive heating element present more toward the side opposite to the retaining side of the susceptor which has a flatness less than 500 um or less with a diameter 200 mm or more, the heating element having a width .5 mm and a line interval of .5 mm, and a heat-reflecting support plate (2) attached to the susceptor. Kuibira further shows that its wafer holder is heated to 700° C with a temperature distribution within the range of  $\pm 1.0^{\circ}$  C which is within in  $\pm .15\%$ . But, Kuibira does not show the recited porosity, the surface roughness, the heating element thickness and the metal plate support (2) having the recited thermal conductivity and attached to the susceptor with an adhesive bonding layer, screws or recess.

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Hiramatsu shows that the ceramic susceptor can be made of silicon carbide, aluminum nitride as well as alumina and boron nitride, and it further shows that the semiconductor wafer chuck with a ceramic substrate with the porosity less than 5%, and, preferably from 0.01 to 3%. It would have been obvious to adapt Kuibira with the ceramic susceptor having the claimed porosity for a high thermal conductivity and prevent breakdown of the voltage drop in the ceramic substrate to improve the chucking of a wafer to the heating surface

Fure shows that it is known to provide a wafer holding ceramic heater having a surface roughness of under 5 microns and its surface flatness about 100 microns. Also, Fure shows a heating element whose thickness is about 50 microns with the heating element pattern spacing more than 0.1 mm. Fure also shows that it is known to provide a temperature dispersion within  $\pm 0.5^{\circ}\text{C}$  on the wafer mounting face. In view of Fure, it would have been obvious to one of ordinary skill in the art to adapt Kuibira with the recited surface roughness and the heating element thickness to further improve the uniform heating distribution along the wafer mounting heating surface.

Kadomura shows it is known in the art to provide a metal plate (2) as a support plate for a ceramic susceptor wherein the metal plate is made of the claimed aluminum silica carbide composite material. Kadomura also shows a metal plate 8(b) made of molybdenum attached along with the metal support plate. Kadomura shows that the metal plate would display the over 100 W/mk or more thermal conductivity with a thickness that is greater than the susceptor. Shamouilian also shows it is known in the art to provide a ceramic susceptor made with alumina, silica or boron carbide having a resistive heating element incorporated therein with a metal bonding layer/plate (295) made of copper and molybdenum alloy along with a support (190)

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made of aluminum and silicon carbide as well as copper, tungsten, and molybdenum and its mixture thereof (see column 11, lines 20-31). In view of Kadomura or Shamouilian, it would have been obvious to one of ordinary skill in the art to adapt Kuibira with the metal support plate having the claimed materials including aluminum silicon carbide or copper-molybdenum, which is known to provide a higher thermal conductivity than the ceramic susceptor, to provide alternatively suitable heat transfer means to allow the susceptor either to heat or cool the thermal energy generated by the heating element toward the retaining side.

Kanno shows that it is known in the art that a bolt is used to fix a ceramic susceptor or heater to a cooling jacket, and Takuma also shows that it is known to provide an adhesive bonding layer between an aluminum nitride member to a metal member. In view of Kanno or Takuma, it would have been obvious to one of ordinary skill in the art to provide various means such as an adhesive bonding layer, screws or any other suitable means to join the susceptor and the metal plate so that a close and tight contact can be made to enhance a thermal transfer between the members.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

With respect to Kadomura, the applicant argues that Kadomura does not teach a heat-reflecting metal plate fastened directly to a susceptor. It is noted that Kuibira is applied to teach a susceptor that is directly mounted on a heat reflecting support plate (2), Kadomura as well as Shamouilian references are applied to teach that it is known to provide a support plate made of

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metals including aluminum, aluminum carbide, as well as copper, tungsten and molybdenum as claimed.

The applicant's arguments with Kadomura are moot in view of new ground of rejections.

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (6:30-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sang Y Paik/

Primary Examiner, Art Unit 3742

syp